UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
GULF OF MEXICO REGION

ACCIDENT INVESTIGATION REPORT

For Public Release

1. OCCURRED
   DATE: **18-APR-2014** TIME: **1900** HOURS

2. OPERATOR: **Black Elk Energy Offshore Operatio**
   REPRESENTATIVE:
   TELEPHONE:
   CONTRACTOR:
   REPRESENTATIVE:
   TELEPHONE:

3. OPERATOR/CONTRACTOR REPRESENTATIVE/SUPERVISOR ON SITE AT TIME OF INCIDENT:

4. LEASE: **G02274**
   AREA: **VR** LATITUDE:
   BLOCK: **369** LONGITUDE:

5. PLATFORM: **A**
   RIG NAME:

6. ACTIVITY:
- [ ] EXPLORATION(POE)
- [X] DEVELOPMENT/PRODUCTION (DOCD/POD)

7. TYPE:
- [ ] HISTORIC INJURY
  - [ ] REQUIRED EVACUATION
  - [ ] LTA (1-3 days)
  - [ ] LTA (>3 days
  - [ ] RW/JT (1-3 days)
  - [ ] RW/JT (>3 days)
  - [ ] Other Injury
- [ ] FATALITY
- [ ] POLLUTION
- [X] FIRE
- [ ] EXPLOSION
- LWC
  - [ ] HISTORIC BLOWOUT
  - [ ] UNDERGROUND
  - [ ] SURFACE
  - [ ] DEVERTER
  - [ ] SURFACE EQUIPMENT FAILURE OR PROCEDURES
- COLLISION [ ] HISTORIC [ ] >$25K [X] <=$25K
- [ ] STRUCTURAL DAMAGE
- [ ] CRANE
- [ ] OTHER LIFTING DEVICE
- [ ] DAMAGED/DISABLED SAFETY SYS.
- [ ] INCIDENT >$25K
- [ ] H2S/15MIN./20PPM
- [ ] REQUIRED MUSTER
- [ ] SHUTDOWN FROM GAS RELEASE
- [ ] OTHER

6. OPERATION:
- [X] PRODUCTION
- [ ] DRILLING
- [ ] WORKOVER
- [ ] COMPLETION
- [ ] HELICOPTER
- [ ] MOTOR VESSEL
- [ ] PIPELINE SEGMENT NO.
- [ ] OTHER

8. CAUSE:
- [X] EQUIPMENT FAILURE
- [ ] HUMAN ERROR
- [ ] EXTERNAL DAMAGE
- [ ] SLIP/TRIP/FALL
- [ ] WEATHER RELATED
- [ ] LEAK
- [ ] UPSET H2O TREATING
- [ ] OVERBOARD DRILLING FLUID
- [ ] OTHER

9. WATER DEPTH: **316** FT.

10. DISTANCE FROM SHORE: **100** MI.

11. WIND DIRECTION:
    SPEED: M.P.H.

12. CURRENT DIRECTION:
    SPEED: M.P.H.

13. SEA STATE: FT.

17. INVESTIGATION FINDINGS:

On April 18, 2014, a fire occurred at approximately 7:00pm on Black Elk Energy Offshore Operating LLC (BEEOO) Vermillion 369-A (VR369A) facility. This facility was installed on January 1, 1979 by a previous operator. At the time of the incident, witnesses heard a platform process alarm and an operator responded to the master panel to identify the cause. Upon arrival at the panel, the operator identified a Burner Safety Low (BSL) alarm indication, and then proceeded to the heater treater where he noticed a small amount of oil dripping from the fire tube. At this time, the operator looked through the inspection plate of the fire tube and saw a small fire. Next, he isolated the manual block valves associated to the supply gas and then realized the fire still had not subsided. Based on the circumstances the operator utilized the Gaitronics paging system to alert other personnel on the platform of the situation and then activated a nearby Emergency Shut-Down (ESD) station. The platform Safety Analysis Function Evaluation Chart depicts that the BSL is only required to shut-off gas supply to the heater treater fired component and the line heater burner (such as the main burner and pilot) and indicate an alarm; therefore, oil and gas production momentarily remained online until such time the operator manually shut-in production via the ESD. Shortly after, the other operators arrived to the scene and together they opened the fire tube inspection plate and applied two short bursts from a handheld fire extinguisher which successfully extinguished the fire.

Subsequent to extinguishing the fire, the operators monitored the area and then assessed the cause of the fire. The operator's assessment revealed that a pin hole developed in the heater treater fire tube; therefore, produced oil leaked inside the fire tube and sprayed in the vicinity of the main burner which enabled a steady fuel source although the burner fuel gas had been shut off.

On April 21, 2014, the BSEE Lake Charles District conducted an onsite investigation into this incident. At this time the operator's findings were confirmed with respect to the pin hole at the top of the fire tube. Additionally, it was noted that there were neither any records nor recollection within BEEOO to support if and/or when prior maintenance/inspection had been performed with regards to the fire tube. Furthermore, upon document reviews, it appeared a BEEOO in-house Root Cause Analysis (RCA) from December 30, 2013 had identified that due to large quantities of acid being pumped directly to the treater (100 - 150 gallons per week), inspection of the fire tube should be performed; however, this had not taken place prior to the incident.

The following is an account of BSEE's recent inspection findings before the subject incident occurred. On April 9, 2014, prior to the incident, the BSEE Lake Charles District had begun conducting an inspection of the facility. During the inspection, inspectors developed concern regarding the integrity of the fire tube inside the Heater Treater NBK-2100. It was found that the treater was being subjected to batch treating with a high volume of acid multiple times a week. On April 10, 2014, inspectors returned to VR 369A to resume the inspection and continued gathering information associated with the integrity of the heater treater fire tube and batch treating of the vessel. There was a lack of documentation onboard the facility showing that the fire tube had ever been removed from the vessel and inspected in the past. At this time, pictures were taken of the vessel and the burner with a request to research any known history of when the last inspection of the fire tube had taken place. While the inspection remained ongoing, prior to receiving any of the requested inspection documentation from BEEOO, the fire occurred on April 18, 2014.

Batch treating with an acid based de-emulsifier was being carried out as needed, which was typically multiple times a week, to break an emulsion pad created in the treater. The chemical program and also a lack of sufficient heat were considered possible causes of the emulsion pad. Approximately 20 gallons of the acid based de-emulsifier (Gyptron TA-21) were being pumped at a rate of 1.33 gallons per minute into the Test Separator (MBD-1200) oil outlet per batch treatment. The treated oil flows directly into the fire tube section of the Heater Treater which subjected the tube to acid related degradation. TA-21 was being pumped into the line with a M2

diaphragm pump. BEEOO has reported multiple pump failures as a result of acid corrosion from the use of TA-21. The Heater Treater NBK-2100 operates at 135 psi and 125 degrees Fahrenheit. Through put is approximately 1300 barrels of oil per day and 50 barrels of water per day. Daily, the operators monitored pressures, levels, and temperatures associated with the vessel but the information was not formally documented. The vessel temperature must be maintained below 130 degrees Fahrenheit in order to meet departing pipeline limits set by Shell Pipeline. The Heater Treater electric grid was also out of service.

18. LIST THE PROBABLE CAUSE(S) OF ACCIDENT:

The fire tube failure was due to pit corrosion, which was caused/ accelerated due to the liquid surrounding the fire tube having a low potential of hydrogen due to the vessel being subjected to frequent high dosage batch treatments with acid.

19. LIST THE CONTRIBUTING CAUSE(S) OF ACCIDENT:

BEEOO's failure to inspect the fire tube when possible hazards were first identified.

20. LIST THE ADDITIONAL INFORMATION:

On December 30, 2013, the BSEE Lake Charles District conducted an inspection on VR 369A. As a result of this inspection multiple failures were identified and documented with associated INCs.

*** E-104: High Pressure Vent Scrubber Pump (PBA-2700) failed to operate.**
*** E-104: Low Pressure Vent Scrubber Pump (PBA-2800) failed to operate.**
*** P-175: The Surface Safety Valves on well A-6 and A-8 failed to close within 45 seconds after activation of the Temperture Safety Element Loop.**

Due to the INCs being issued, Black Elk performed a company RCA and an incident investigation which identified exposure to acid as being the cause of the High Pressure and Low Pressure vent scrubber pump failures along with other premature pump failures on the facility. Additionally, the RCA included a strong recommendation to inspect the Heater Treater's fire tube.

21. PROPERTY DAMAGED:	NATURE OF DAMAGE:
Fire Tube	**pin hole in fire tube**

ESTIMATED AMOUNT (TOTAL): **$15,000**

22. RECOMMENDATIONS TO PREVENT RECURRANCE NARRATIVE:

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: **YES**

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

G-111 the Lessee failed to maintain the Heater Treater (NBK-2100) in a safe and workmanlike manner which led to a fire incident on 18-APR-2014.

25. DATE OF ONSITE INVESTIGATION:

21-APR-2014

26. ONSITE TEAM MEMBERS:

Chad Chaffin / Scott Bazinet / Darron Miller /

29. ACCIDENT INVESTIGATION PANEL FORMED: **NO**

OCS REPORT:

30. DISTRICT SUPERVISOR:

Larry Williamson

APPROVED DATE: **24-JUN-2014**

FIRE/EXPLOSION ATTACHMENT

1. SOURCE OF IGNITION: **Heater Treater Fired Componen**

2. TYPE OF FUEL:
- [ ] GAS
- [x] OIL
- [ ] DIESEL
- [ ] CONDENSATE
- [ ] HYDRAULIC
- [ ] OTHER

3. FUEL SOURCE: **Pin hole leak in fire-tube**

4. WERE PRECAUTIONS OR ACTIONS TAKEN TO ISOLATE KNOWN SOURCES OF IGNITION PRIOR TO THE ACCIDENT ? **NO**

5. TYPE OF FIREFIGHTING EQUIPMENT UTILIZED:
- [x] HANDHELD
- [ ] WHEELED UNIT
- [ ] FIXED CHEMICAL
- [ ] FIXED WATER
- [ ] NONE
- [ ] OTHER

INJURY/FATALITY/WITNESS ATTACHMENT

[ ]

INJURY/FATALITY/WITNESS ATTACHMENT

[X] OPERATOR REPRESENTATIVE
[ ] CONTRACTOR REPRESENTATIVE
[ ] OTHER _____

[ ] INJURY
[ ] FATALITY
[X] WITNESS

NAME:

HOME ADDRESS:

CITY: STATE:

WORK PHONE: TOTAL OFFSHORE EXPERIENCE: **18** YEARS

EMPLOYED BY: **Black Elk Energy Offshore Operations, LLC / 03033**

BUSINESS ADDRESS: **11451 Katy Freeway**

Suite 500

CITY: **Houston** STATE: **TX**

ZIP CODE: **77079**

[X] OPERATOR REPRESENTATIVE
[ ] CONTRACTOR REPRESENTATIVE
[ ] OTHER _____

[ ] INJURY
[ ] FATALITY
[X] WITNESS

NAME:

HOME ADDRESS:

CITY: STATE:

WORK PHONE: TOTAL OFFSHORE EXPERIENCE: **14** YEARS

EMPLOYED BY: **Black Elk Energy Offshore Operations, LLC / 03033**

BUSINESS ADDRESS: **11451 Katy Freeway**

Suite 500

CITY: **Houston** STATE: **TX**

ZIP CODE: **77079**

INJURY/FATALITY/WITNESS ATTACHMENT

[X] OPERATOR REPRESENTATIVE
[ ] CONTRACTOR REPRESENTATIVE
[ ] OTHER _____

[ ] INJURY
[ ] FATALITY
[X] WITNESS

NAME:

HOME ADDRESS:

CITY: STATE:

WORK PHONE: TOTAL OFFSHORE EXPERIENCE: **30** YEARS

EMPLOYED BY: **Black Elk Energy Offshore Operations, LLC / 03033**

BUSINESS ADDRESS: **11451 Katy Freeway**

Suite 500

CITY: **Houston** STATE: **TX**

ZIP CODE: **77079**

[ ] OPERATOR REPRESENTATIVE
[X] CONTRACTOR REPRESENTATIVE
[ ] OTHER _____

[ ] INJURY
[ ] FATALITY
[X] WITNESS

NAME:

HOME ADDRESS:

CITY: STATE:

WORK PHONE: TOTAL OFFSHORE EXPERIENCE: **9** YEARS

EMPLOYED BY: **ISLAND OPERATORS CO. INC. / 20324**

BUSINESS ADDRESS: **108 ZACHARY**

CITY: **LAFAYETTE** STATE: **LA**

ZIP CODE: **70583**

INJURY/FATALITY/WITNESS ATTACHMENT

[x] OPERATOR REPRESENTATIVE
[ ] CONTRACTOR REPRESENTATIVE
[ ] OTHER _____

[ ] INJURY
[ ] FATALITY
[x] WITNESS

NAME:

HOME ADDRESS:

CITY: STATE:

WORK PHONE: TOTAL OFFSHORE EXPERIENCE: **8** YEARS

EMPLOYED BY: **Black Elk Energy Offshore Operations, LLC / 03033**

BUSINESS ADDRESS: **11451 Katy Freeway**

Suite 500

CITY: **Houston** STATE: **TX**

ZIP CODE: **77079**